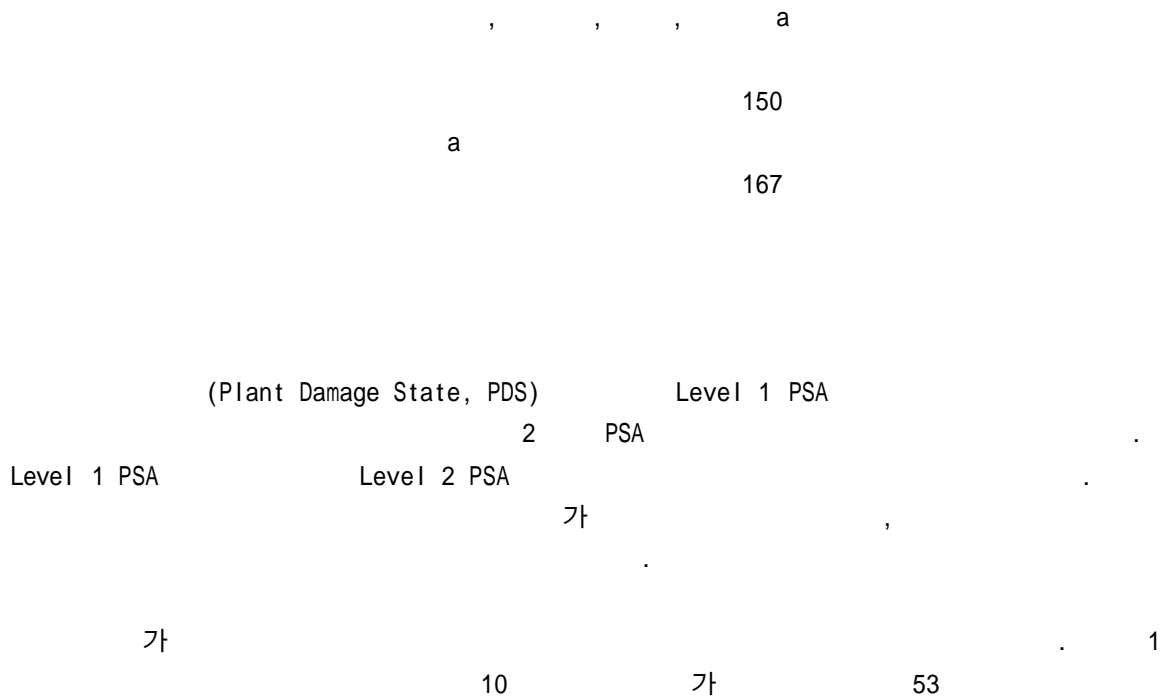


2003

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Analyses of Plant Damage States for Wolsong Unit 1



Abstract

The interface between the Level 1 systems analysis and the Level 2 containment analysis is the classification of accident sequences into plant damage states (PDSs). The PDSs are defined by the sets of functional characteristics of system operation that are important to subsequent accident progression, containment failure, and source term analyses. To bin core damage sequences into PDSs systematically, the PDS logic diagram is used. A PDS logic diagram is constructed with PDS grouping parameters as decision branches, to aid in the assembly of specific PDS characteristics from the matrix of all possible combinations allowed by the grouping parameters. Ten parameters are selected to define the Wolsong 1 PDSs, resulting in 53 PDS numbers.

1.

Level 1 PSA

Level 2 PSA
(Plant Damage State, PDS)

[1].

1

Level 1 PSA

. , Level 1 PSA

가

, 가

Level 1 PSA

Level 1 PSA

2.

Level 1 PSA

, 가

Level 1 PSA

Level 1 PSA

. 2

2.1 가

가

- 100 %

-

-

-

(Steam Generator Tube Rupture)

2.2

2.2.1

(/ , () ,)
[2] .

3 ,
가
/ , , Dousing Tank ,
PSA , Level 2 PSA , Level 1

2.2.2

Level 2 PSA

2.2.3

가 Level 2 PSA PSA

2.3

PDS , , 1 ,
10 가 ,

- (CONBYPASS)

1

가

(CC)
CC가

SGTR

CC가 SGTR

1) No bypass, 2) SGTR with Crash Cooldown (CC), 3) SGTR without CC

3가 가

- (CONISOLAT)

1

1)

2)

2가 가

- (ACCITYPE)

PWR

LOCA 가

가

가

가

가

1)

2)

2가 가

- (ICC : Fuel Debris Cooled in Calandria)

CANDU

가

1 PSA

가

가

ICC

가

()

()

1) () 2) () 2가 가

(FW)

가 가 가
LOCA

가

가

LOCA

1) () 2) () 2가 가

(EWS)

가 가

LOCA
LOCA

1) () 2) () 2가 가

(CLAC)
(LAC)가

33MW_{th}

1.6%

가

1) () 2) () 2가 가

(DS)

가 2/3/4
(DS)가

가 1

가 가

1) () 2) () 2가 가 .

- (SC)

가 .

7.3 MWth

1) () 2) () 2가 가 .

- (CHIS)

가

1 가

1) () 2) () 2가 가 .

2.4 (PDS)

가 .

가

가 (가)

가

1

, 3 10

53

PDS 1

LOCA

. PDS 2 14

. PDS 2

. PDS 15 51 LOCA , LOCA

PDS

15

. PDS 16 27 /

, PDS 28 39 EWS

가

PDS 40 ~ 51

가

. PDS 52 SGTR

PDS 53

2.5

2.5.1

Level 1 PSA

Level 1 PSA 가

Level 1 PSA

가

Level 1 PSA

Level 1 PSA

Level 2 PSA

Level 2 PSA
Level 1 PSA

() 가

Level 2 PSA /

Level 2 PSA

Level 1 PSA

Level 1 PSA

"1.5 "

Level 1 PSA

가

가

2.5.2

Level 1 PSA

(KIRAP, SAREX)

Level 1 PSA

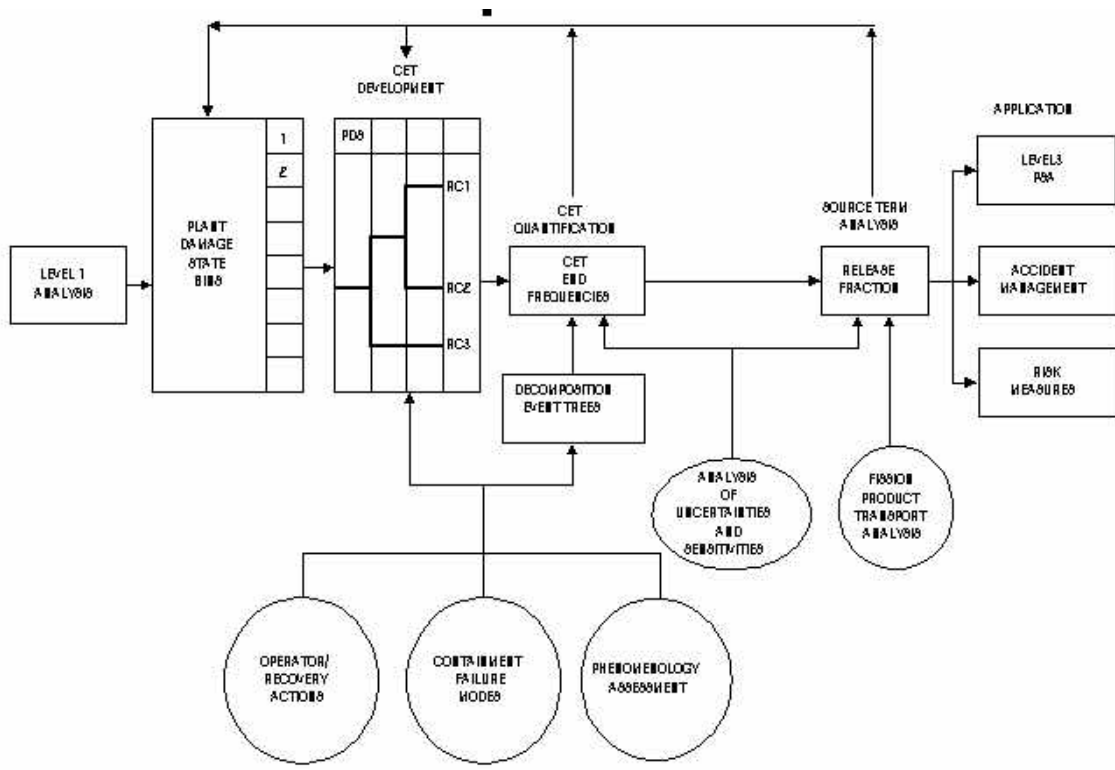
Level 1 PSA

2.6

(PDS)

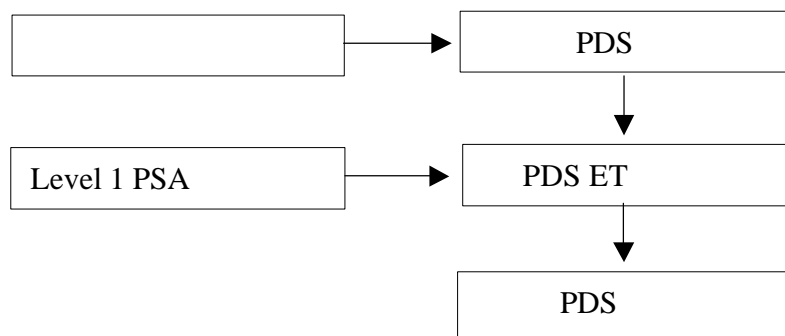
. CONPAS [3] . (PDS1)
 , [4].
 Level 2 PSA
 . PSA
 가 가 .
 3.
 53 가 2 .

1. “가 2 가[],” , 1997 8 .
2. “Wolsong NPP 1 FSAR,” KEPCO, November 1989.
3. K.I. Ahn., “CONPAS 1.0 Code Package ,” KAERI/TR-651/96, KAERI, 1996 4
4. “A Study on Individual Plant Examination of Nuclear Power Plants (Containment Performance Analysis),” KEPCO, February 1994.



1. 2

가



2.

